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EPA UIC Dewey-Burdock Information Sheet

How Much Groundwater Will Be Lost from the Inyan Kara Aquifers?

Most of the water pumped from the Inyan Kara aquifers will be reinjected back into the ISR wellfields. The net withdrawal rate will be only a small fraction of the gross pumping rate.

With ISR operation and groundwater restoration occurring at the same time in different wellfields, the gross pumping rate is expected to be 8,500 gallons per minute. The "bleed rate," or amount of groundwater removed from the Inyan Kara aquifers, is expected to be 75 gallons per minute for the majority of uranium recovery operations and groundwater restoration.

The table below (Table 18 from the Class III Area Permit Fact Sheet) summarizes the injection and extraction flow rates. (See Section 9.3 of the Class III Area Permit Fact Sheet for more information.)

As discussed in Section 3.1.1 of the draft Cumulative Effect Analysis document, there may be occasion for the groundwater restoration bleed to increase up to 17% for short periods of time. In this case, the maximum amount of groundwater removed from Inyan Kara aquifers could briefly reach a maximum rate of 155 gallons per minute. This amount of groundwater lost from the Inyan Kara aquifers is within the requirements of the South Dakota law. (See the draft Cumulative Effect Analysis document for more information.)

To put this groundwater usage rate into perspective, a center-pivot irrigation system with 100% efficiency, pumping 24 hours a day, seven days a week at 155 gpm would irrigate a 125.6-acre circular area within a quarter section, applying 0.457 inch of water per week.

Operation Phase	Extraction Flow Rate (gpm)	Bleed (%)	Re-injection Flow Rate (gpm)	Bleed (gpm)
Uranium Recovery	8,000	0.875%	7,930	70
Groundwater restoration	500	1.0%	495	5
Concurrent Uranium Recovery and Groundwater restoration	8,500	0.88%	8,425	75

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How Much Groundwater Will Be Used from the Madison Aquifer?

Powertech plans to use groundwater from the Madison aquifer to replace the groundwater removed from the Inyan Kara aquifers by uranium recovery operations and ground-water restoration activities.

Powertech also plans to use Madison groundwater to provide a water supply to the owners of private wells located within the Dewey-Burdock Project Boundary.

Powertech states in Section 4.4.2 of the UIC Class III Permit Application that all domestic wells within the Project Area Boundary and all stock wells within ¼ mile of uranium recovery wellfields will be removed from private use or, at a minimum, the domestic wells will be removed from drinking water use. The wells affected are shown in Figure 4.11 of the Class III Permit Application.

Powertech proposes to install up to two water supply wells completed in the Madison aquifer, one in the Dewey Area and one in the Burdock Area of the Project Site.

EXPLANATION

OUTCROP OF MADISON LIMESTONE (from Strobel and others, 1999)

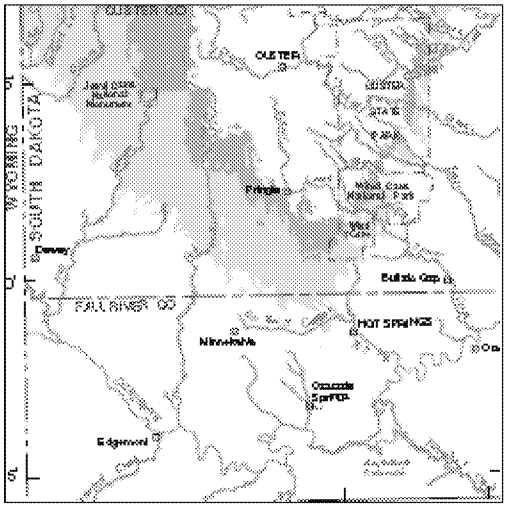
OUTCROP OF MINNELUSA FORMATION (from Strobel and others, 1999)

APPROXIMATE EXTENT OF THE BLACK HILLS AREA, REPRESENTED BY GENERALIZED OUTER EXTENT OF INYAN KARA GROUP (modified from Strobel and others, 1999)

from Driscoll et al., 2002, USGS Water-Resources Investigations Report 02-4094

In order to use Madison aquifer groundwater, Powertech has requested from the South Dakota Water Rights Program the appropriation of a maximum rate of 551 gpm (equivalent to 1.228 cubic feet per seconds or 888.8 acre-foot of water per year) from the Madison aquifer.

South Dakota Water Rights Program staff reviewed the available information for the Madison aquifer and concluded that an approval of Powertech's application will not result in an average annual withdrawal from the Madison aquifer will not exceed the average annual recharge to the aquifer. South Dakota Water Rights Program staff also determined that there is reasonable probability that Powertech's consumptive use will not adversely impact existing water rights including domestic users.



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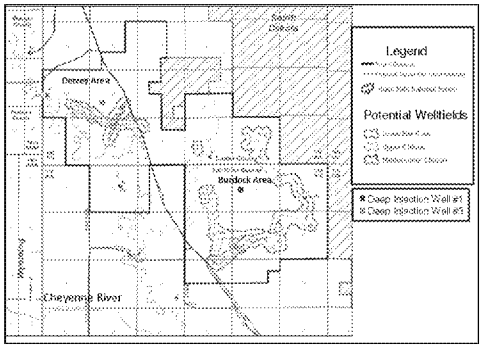
What affect will the Aquifer Exemption have on Inyan Kara Aquifers?

The EPA has proposed a draft aquifer exemption for the uranium-bearing portions of the Inyan Kara aquifers. UIC regulations allow exemption of portions of aquifers containing minerals in economically producible quantities from protection against contamination provided under the Safe Drinking Water Act.

The purpose of the proposed aquifer exemption is to allow injection of lixiviant to mobilize uranium from the ore deposits.

The lixiviant is composed of Inyan Kara ground-water with oxygen and carbon dioxide added.

The aquifer exemption boundary is located 120 feet outside of the wellfield perimeter monitoring well rings. This distance was determined based on site-specific aquifer conditions.



The green-dashed line shows the aquifer exemption boundary location.

After uranium recovery process has been completed in a wellfield, the Nuclear Regulatory Commission (NRC) License requires Powertech to restore the groundwater within the aquifer exemption area to pre-mining concentrations or Alternative Concentration Limits that must be protective of human health and the environment.

Inyan Kara groundwater outside the uranium ore deposits contains concentrations of manganese, sulfate, total dissolved solids and, in some places iron, that exceed the secondary drinking water standards for taste and order.

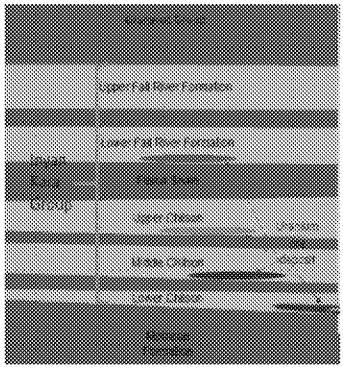
Users of Inyan Kara groundwater currently use reverse osmosis treatment before drinking it.

Inyan Kara groundwater within the ore deposits exceed the primary drinking water standards for radium and gross alpha.

The Class III Area Permit does not allow the Inyan Kara aquifers outside the aquifer exemption boundary to be impacted by any contaminants resulting from uranium recovery.

After the groundwater restoration required by the NRC, Inyan Kara aquifer users will be able to drink Inyan Kara groundwater after using the same level of treatment use before uranium recovery activities.

Vertical Extent of the Proposed Exempted Portion of the Inyan Kara Aquifers



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EPA Review of the Abandoned Uranium Mines

The EPA received a citizen's petition under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 105(d) to investigate the abandoned uranium mines located within the proposed Dewey-Burdock Project Area. These mines include the Darrow open pit mines and the Triangle open pit. The figure below shows the locations of the mines and spoil piles, which consist of crushed overburden and waste rock, in the northeast Burdock Area.

In response to a citizen's petition, the EPA conducts a preliminary assessment (PA) within 12 months or provides a rationale as to why one is not needed. The citizens raised concerns that the DFT mines, as well as the proposed ISR project, would destroy the land and water in the area and jeopardize public health and wildlife. The EPA completed the PA and concluded that further investigation was warranted. These results were communicated to the petitioner and other stakeholders in September 2014.

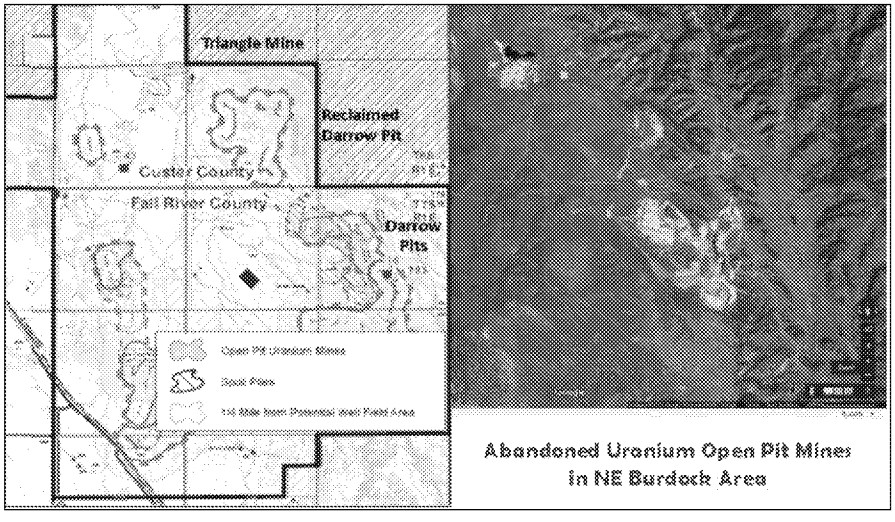
The EPA conducted a Site Inspection (SI) in September 2015 to evaluate potential impacts to sensitive environments and fisheries. Sampling was limited to surface water and sediments since access was not granted to mine source areas.

The SI report was completed in March 2016. Analytical results of the surface water samples showed that concentrations of total metal uranium, uranium-238, and radium-226 did not exceed three times background concentrations, which is the threshold the EPA uses for indication of a contaminant release. No health based or ecological standards were exceeded for these constituents.

A release of metals and radionuclides to the surface water pathway could not be documented for the Site. Therefore, further remedial response actions are not warranted at this time.

The EPA made a no further remedial action planned (NFRAP) decision, since the Site does not qualify for the National Priorities List (NPL) based on existing information as of March 2016.

If conditions change or if there is a change in land use in this area, the EPA can reassess the site in the future.



Abandoned Uranium Open Pit Mines in NE Burdock Area